Electrically Operated Pressure-Relief Cartridge, Size 16

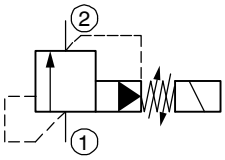
Q_{max} = 350 l/min (92 gpm), p_{max} = 420 bar (6000 psi)
seated pilot stage, spool-type design, electrically operated
Series WUVPB-1…

- Compact construction for cavity type EB – M42x2 to ISO 7789-42-06-0-07
- Bypass circuit ON / OFF
- 2-pressure switching HI / LO
- With internal pilot-oil drain to 2
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available
- All exposed parts with zinc-nickel plating
- Can be fitted in a line-mounting body

1 Description

Series WUVPB-1… valves are size 16 electrically operated pressure relief cartridges with an M42x2 mounting thread. They have a seated pilot stage and a spool-type main stage. Using the external pressure adjustment, the higher pressure p1 (relief setting) and the lower pressure p2 (a secondary pressure, or the unloaded pressure) can be varied smoothly and independently of one another without opening the hydraulic envelope, and either pressure can be selected. When the pilot stage is active (pressure relief function), pilot oil is drained internally to port 2. Any pressure at port 2 is additive to the valve setting, therefore port 2 should preferably be routed directly to tank. All external parts of the cartridge are zinc-nickel plated to DIN 50 979 and are thus suitable for use in the harshest operating environments. The slip-on coils can be replaced without opening the hydraulic envelope and can be positioned at any angle through 360°. If you intend to manufacture your own cavities or are designing a line-mounting installation, please refer to the section “Related data sheets”.

2 Symbol



3 Technical data

General characteristics	Description, value, unit	
Designation	pressure-relief cartridge valve	
Design	spool-type design, seated pilot, electrically operated	
Mounting method	screw-in cartridge M42 x 2	
Tightening torque	200 Nm ± 10 %	(150 ft-lbs ± 10 %)
Size	nominal size 16, cavity type EB to ISO 7789-42-06-0-07	
Weight	1.25 kg	(2.75 lb)
Mounting attitude	unrestricted	
Ambient temperature range	-25 °C … +50 °C	(-13 °F … +122 °F)

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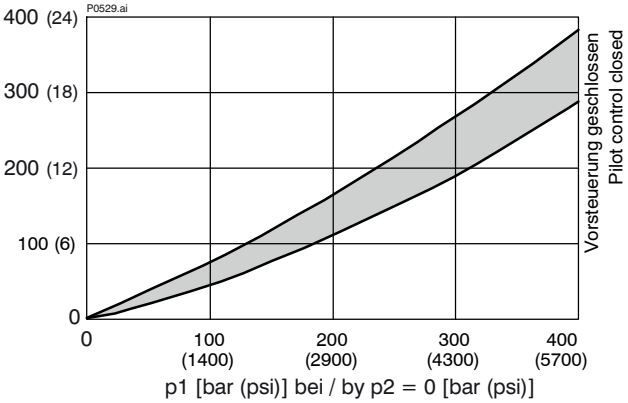
Hydraulic characteristics		Description, value, unit	
Maximum operating pressure	- main port 1 [1)] - port 2 (tank)	420 bar 250 bar	(6000 psi) (3600 psi)
Pressure adjustment range:		420 bar 350 bar 250 bar 160 bar 100 bar 40 bar	(6000 psi) (5000 psi) (3600 psi) (2300 psi) (1400 psi) (570 psi)
Maximum flow rate		350 l/min	(92 gpm)
Flow direction		1 → 2, see symbols	
Hydraulic fluid		HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER	
Hydraulic fluid temperature range		-25 °C … +80 °C	(-13 °F … +176 °F)
Viscosity range		10…500 mm²/s (cSt), recommended 15...250 mm²/s (cSt)	
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999		class 20/18/15	

Electrical characteristics	Description, value, unit
Supply voltage	12 V DC, 24 V DC / 115 V AC, 230 V AC (50 … 60 Hz)
Supply voltage tolerance	± 10 %
Nominal power consumption	V DC = 27 W V AC = 25 W
Switching time	50 … 300 ms (energising) … ≤ 30 ms (de-energising) Depending on pressure, flow rate and viscosity as well as dwell time under pressure, the switching times may vary from the the stated values.
Relative duty cycle	100 %
Protection class to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see “Ordering code” (with appropriate mating connector and proper fitting and sealing)
Electrical connection	DIN EN 175301-803, 3-pin 2 P+E (standard) for other connectors, see “Ordering code”

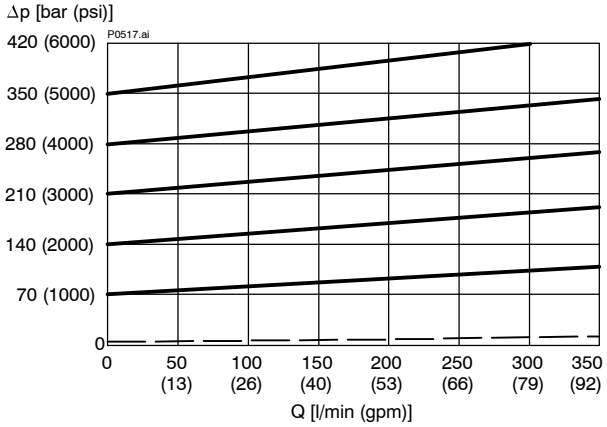
ATTENTION!
[1)] Any residual- or surge-pressure in port 2 (tank pressure) is additive to the pressure setting in port 1.

4 Performance graphs measured with oil viscosity 33 mm²/s (cSt)

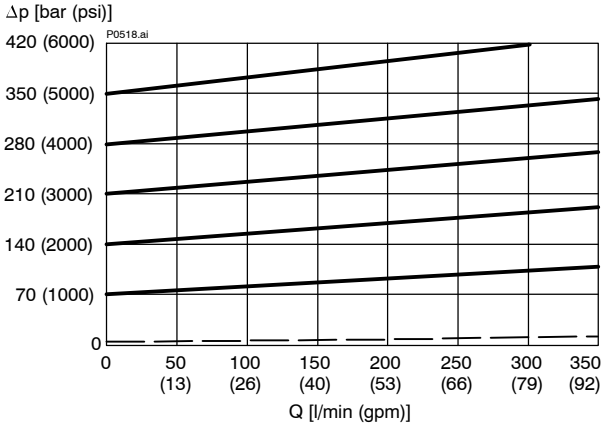
Q_L = f (p) Leakage flow rate characteristic (1 → 2)
Q [cm³/min (in³/min)]



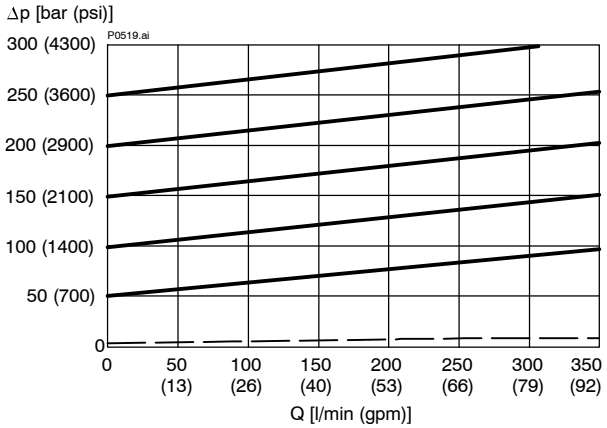
Δp = f (Q) Pressure-drop characteristic (420 bar)



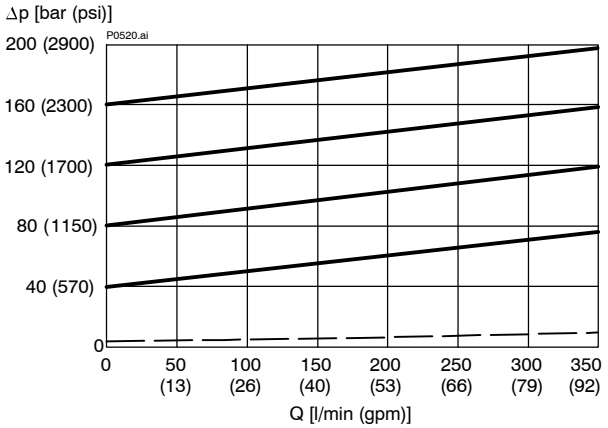
Δp = f (Q) Pressure-drop characteristic (350 bar)



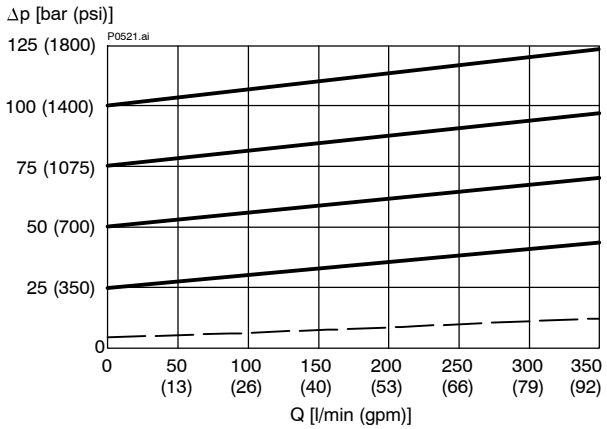
Δp = f (Q) Pressure-drop characteristic (250 bar)



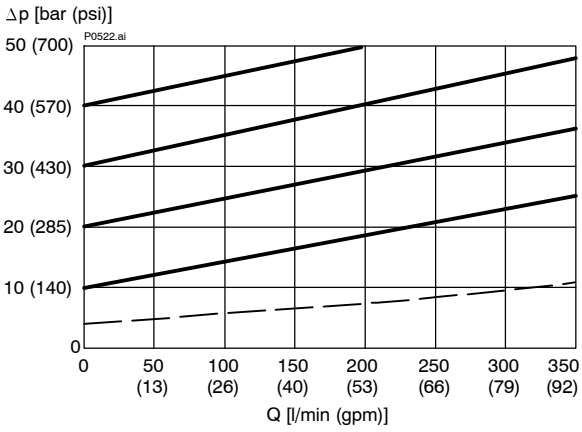
Δp = f (Q) Pressure-drop characteristic (160 bar)



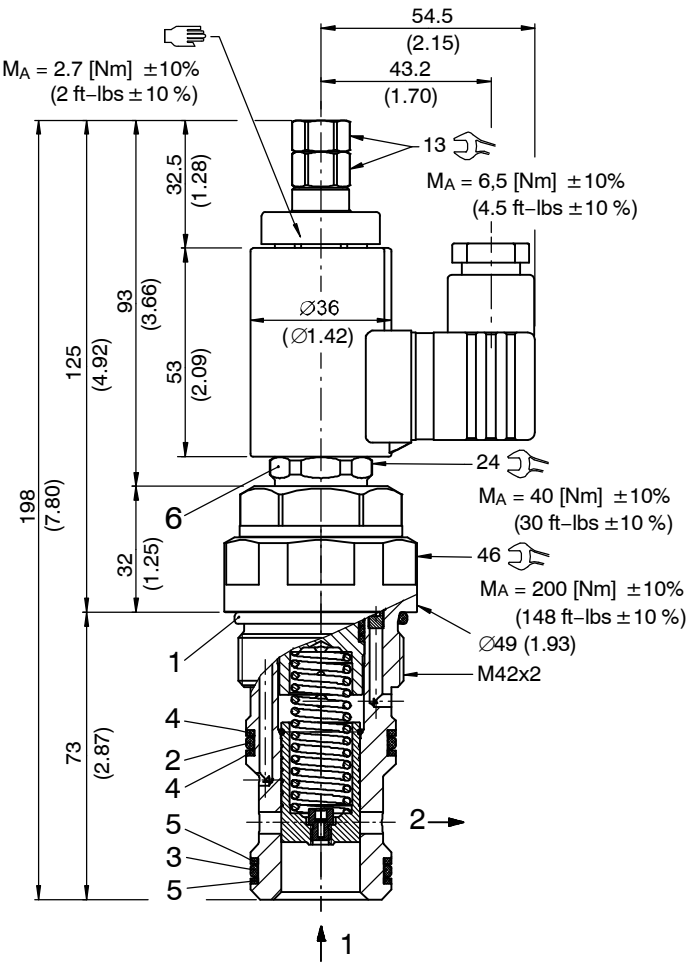
Δp = f (Q) Pressure-drop characteristic (100 bar)



Δp = f (Q) Pressure-drop characteristic (40 bar)



5 Dimensions & sectional view



Seal kit NBR no. DS-357-N [2)]

Item	Qty.	Description
1	1	O-ring no. 129 ∅ 39.34 x 2.62 N90
2	1	O-ring no. 125 ∅ 32.99 x 2.62 N90
3	1	O-ring no. 124 ∅ 31.42 x 2.62 N90
4	2	Backup ring ∅ 32.00 x 2.00 x 1.40 FI0751
5	2	Backup ring ∅ 30.00 x 2.00 x 1.40 FI0751
6	1	Seal kit NBR DS-317-N

IMPORTANT!

[2)] Seal kit with FKM (Viton) seals, no. DS-357-V

6 Installation information

IMPORTANT!
When fitting the cartridges, use the specified tightening torque.

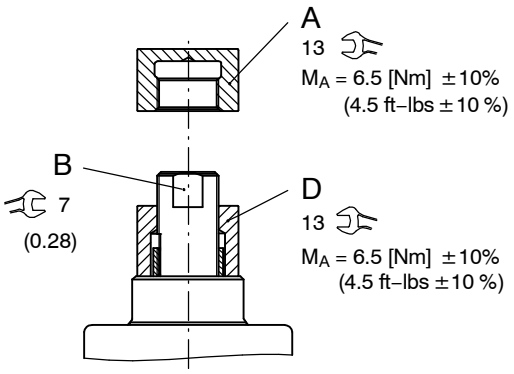
ATTENTION!
Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

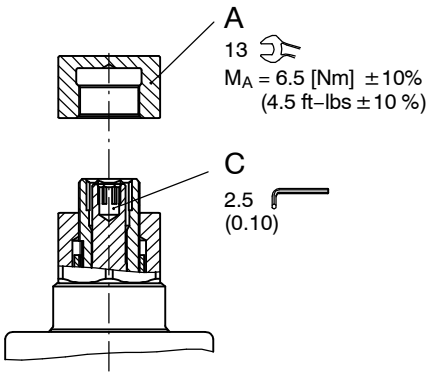
7 Pressure adjustment

(pressure p1 must be set first, followed by pressure p2)

Nr.	Setting the higher pressure p1 on series WUVB… as the higher working pressure with solenoid energised:
1)	Slacken and remove cap nut item A (13 A/F).
2)	Slacken lock nut item D (13 A/F) approx. ½ turn.
3)	With pump running and with the solenoid energised, use the two flats (7 A/F) to turn adjusting screw item B until the required pressure is set in port 1.
4)	Hold the adjusting screw item B using the 7 A/F flats while tightening the lock nut item D (13 A/F).
5)	Refit and tighten the cap nut item A.

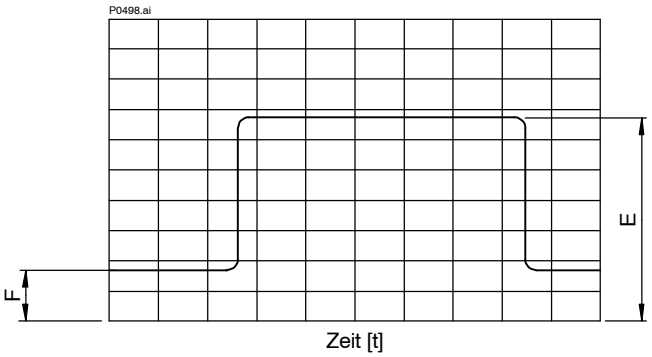
Nr.	Setting the lower pressure p2 (emergency pressure setting) on series WUVB… (a second pressure or alternatively, unload) with solenoid de-energised:
1)	Slacken and remove cap nut item A (13 A/F).
2)	With pump running and with the solenoid de-energised, use the adjusting screw item C (2.5 A/F hex. socket) to set the pressure p2 in port 1.
3)	Refit and tighten the cap nut item A. (p2 min.: 2 … 10 bar, dependent on flow).





ATTENTION!
When setting pressure p1, adjusting screw item B must not be overtightened as this can damage the shoulder which limits the maximum pressure setting. As soon as a definite end-stop can be felt, do not turn any further.

Example – showing the adjustable pressures p1 and p2:



E = pressure p1; as set with item B, solenoid energised
F = pressure p2, max. as E, adjustable at item C, solenoid de-energised

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The relief pressure p1 is set as the higher working pressure (E) (solenoid energised)
p2 as the lower working pressure (F) (solenoid de-energised)

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8 Ordering code

Ex. WU | V | P | B - 1 | B | O - 42 - 16 | _ - 1 | 24 | D | _

WU	=	electr. operated pressure-relief valve
V	=	two-stage
P	=	cartridge design
B ... Q	=	standard model per relevant data sheet
Y ... R	=	special features - please consult BUCHER
1	=	pressure function 1 (pressure-relief)
B	=	cavity type EB
O	=	normally open
42	=	pressure range 10 … 420 bar
35	=	pressure range 10 … 350 bar
25	=	pressure range 10 … 250 bar
16	=	pressure range 10 … 160 bar
10	=	pressure range 10 … 100 bar
04	=	pressure range 10 … 040 bar
16	=	nominal size 16
(blank)	=	NBR (Nitrile) seals (**standard**)
V	=	FKM (Viton) seals (special seals - please contact BUCHER)
1 ... 9	=	design stage (omit when ordering new units)
...	=	voltage e.g. **24** (24 V)
D	=	current DC
A	=	current AC
(blank)	=	DIN EN 175301-803 connection with mating plug (**standard, IP 65**)
M100	=	DIN EN 175301-803 connection without mating plug
C	=	Kostal plug connection (IP 65)
JT	=	Junior Timer radial plug connection (with protection diode, IP65)
IT	=	Junior Timer axial plug connection (with protection diode, IP65)
D	=	Deutsch plug connection 45° DT04-2P (IP67/69K)
DT	=	Deutsch plug connection 45° DT04-2P (with protection diode, IP67/69K)
S	=	AMP Superseal 1.5 (IP67) / Metri-Pack 150 (IP65) plug connection
F	=	flying leads (500 mm)

mating plug not supplied

9 Related data sheets

Reference	Description
400-P-040011	The form-tool hire programme
400-P-080111	Cavity type EB
400-P-120110	Coils for screw-in cartridge valves
400-P-287101	Electrically Operated Pressure-Relief Cartridge, Size 1, type WUVB-1
400-P-309101	Stack mounting pressure-relief valve, ISO Size 07, type SWUVPB-1
400-P-750115	Line- and manifold-mounting body, type GEBAA (M42x2)

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Classification: 430.305.300.305.330.300